

2. Program Objectives

The Neighborhood Traffic Calming Program deals with residential and collector streets only. Traffic on the arterial roadways is currently handled by sophisticated traffic control systems. The future may include supplementing arterial traffic control with arterial traffic calming. The primary objective of this program is to enhance the safety and livability of Belmont's neighborhood streets. The program enables the City of Belmont to respond to neighborhood traffic issues using a defined formal process.

The obvious objective of a Traffic Calming Program is to calm traffic, as opposed to controlling traffic. Devices such as signs, striping, pavement messages, traffic signals and police enforcement control traffic, according to laws, rules and regulations passed to legally control the conduct of drivers. Traffic calming, on the other hand, consists of physical measures which change the roadway configuration, and are designed to influence the behavior of drivers.

Traffic calming measures are also designed to inhibit aggressive driving, making drivers want to drive slower in a neighborhood. In the past, special signs such as "Children at Play", "Our Neighborhood Cares" and "Please Drive Slowly" were used to try to influence driver behavior, with little success. The new "toolbox" of physical traffic calming measures has been successful in communities around the world.

Traffic control devices require continuous enforcement, with the threat of punishment for violation, in order to be effective. Traffic calming measures are "self-enforcing". Because they influence behavior, the measures are effective because drivers instinctively comply. Enforcement of traffic control only works when enforcement or threat of enforcement is present. Traffic calming measures work 24 hours per day, 7 days per week.

2.1. Travel Speed

The focus of traffic calming is to alter the physical shape of the roadway to inhibit speed. This is accomplished by vertical measures (such as speed humps) and horizontal measures (such as narrowing the street) that make the roadway more difficult to travel at high speed, either because of discomfort or the need to maneuver the vehicle more in order to negotiate the street.

There are several methods to measure speed trends for neighborhood streets. The most commonly used method is the "85th Percentile" or "Critical" speed, which is the speed that 15% of drivers exceed. Speed studies routinely use this method to determine the speed limit, therefore often "Critical" speeds do not exceed the speed limit by more than 5 mph. Traffic calming programs often use this measurement method as criteria for determining whether to implement traffic calming. If the 85th Percentile speed exceeds the speed limit, usually 25 mph on residential streets, by a set amount, traffic calming is appropriate.

Since speed limits are set to the nearest 5 mph increment of the “Critical” speed, this program uses a threshold of 5 mph over the posted speed as the criteria for implementing traffic calming. This is desirable so that, after traffic calming slows the traffic, and the next official Speed Survey is performed, the speed limit remains unchanged or can be lowered (if higher than 25 mph, the de facto or minimum speed for residential streets) to 25 mph.

Another method to measure speeds is peak speed. In the 1996 speed surveys conducted for Belmont streets, a street with an 85th percentile speed of 26 mph had a peak speed during the test period of over 60 mph. High peak speeds are a more serious safety and livability issue than “Critical” speed. Most traffic calming measures will have a more dramatic impact on reducing peak speeds than “Critical” speeds.

A third method to measure speed is median speed. This means half of the drivers are traveling greater and half less than the posted speed. Normally the median speed is below the speed limit. If used, the criteria would test if the median speed exceeds the posted speed. This is the most restrictive method which, if used, might preclude streets with a low percentage of very high speeds from participating in traffic calming. Since this method is not in common use for eligibility criteria, there is no track record. This method will not be used.

The criteria followed by this program will have as its primary objective the reduction of peak speeds. If measured peak speeds exceed the speed limit by a certain amount, traffic calming is appropriate even though the “Critical” speed criteria may not be met. High peak speeds may also call for more extensive traffic calming measures, such as combining several measures to create a speed barrier. This program will seek to reduce peak speeds to less than 15 mph over the posted limit and critical speeds to under the posted limit.

2.2. Traffic Volume

Another objective of traffic calming installations is to reduce traffic volumes by making a route less attractive as a high traffic street. By making the street appear to be a neighborhood street or a pedestrian friendly street, motorists will be less inclined to use the street as a through roadway. This is accomplished by measures which add pedestrian linkages and landscaping along the roadway.

Residential streets are designed to accommodate peak hourly volumes of approximately 1000 vehicles per day (vpd). Volumes in excess of this amount tend to cause aggressive behavior in drivers and congestion at local intersections. They also tend to create difficulty in safe pedestrian crossings of the street. Some streets which serve as collector roads have the capability to serve slightly higher volumes without congested behavior, but pedestrian crossing safety, which is related to the gaps between approaching vehicles, is not improved. For that reason, this program does not differentiate between collectors and residential streets, but uses a common volume criteria.

Many jurisdictions use a minimum volume threshold of 1000 vpd to determine if traffic calming is appropriate. They also increase eligibility by equating additional volumes to increments of speed. This is a fair comparison because the high volume street probably has lower speeds because the congestion prevents drivers from going faster. This program seeks to reduce street volumes to below 1000 vehicles per day (vpd).

2.3. Cut-Through Traffic

Both speed and volume reduction measures apply to streets with significant “cut-through” volumes. By making the residential street take longer, or appear to handle less traffic, “cut-through” traffic will return to the collector or arterial which was designed to accommodate the traffic volumes.

It is harder to measure “cut-through” volumes because each vehicle’s origin and destination (O/D) must be determined. This is measured by several types of O/D studies, such as license plate surveys (compare plates at each end of the street), manual surveys (stop each car and ask), and post-card surveys (mail-in of post-cards handed out at check points along the route).

When evaluating “cut-through” volumes, the percentage of traffic from outside the neighborhood going to a destination outside the neighborhood is measured. The evaluation must also include whether there is an alternative route using arterial roadways which should be used. Traffic calming can then be approved to encourage use of the appropriate route.

Normally a non-neighborhood volume of 10-20% is considered “normal” for most streets. Streets where cut-throughs are a problem will usually exhibit cut-through volumes in excess of 20%. This program seeks to reduce “cut-through” volumes to below 20%.

2.4. Emergency Response Routes

In Belmont, accommodation of emergency response routes has a significant effect on the ability to install traffic calming measures. Many of Belmont’s neighborhood streets are also emergency response routes because Belmont does not have a clearly defined hierarchy of collector and residential streets. Many neighborhood streets connect directly to the arterial roadways, Ralston Avenue, Alameda de las Pulgas, El Camino Real and Old County Road. Therefore, many residential streets are designated emergency response routes.

Emergency vehicles are affected most by vertical measures, those which cause a vehicle to experience an uncomfortable vertical movement. Measures sufficient to cause discomfort to automobiles will cause a serious effect on much larger vehicles, such as fire engines. These measures can also have a serious effect on medical emergency vehicles carrying patients.

The end result of these increased effects on emergency vehicles is that the vehicles must slow down to negotiate the vertical measures. This in turn will increase the emergency response time. In urban portions of San Mateo County, the maximum, mandatory (i.e. contractual obligation) response time for the first-responding Paramedic-staffed fire company is 6 minutes, 59 seconds to 90% of all medical emergencies. In Belmont, San Carlos, and the Harbor Industrial Area, the governance-adopted performance standard for emergency response is a maximum travel time for the first-arriving fire company of 5 minutes to 80% of all emergency incidents. Failure to meet these response/travel times may require the creation of an additional staffed fire company, the construction of an additional staffed fire station, or similarly costly remedies.

2.5. Impacted Areas

Another factor in determining where to apply traffic calming is to determine the area which has a traffic problem. Sometimes it is a single “spot” location, such as an intersection; sometimes an entire street; but it may also be a network of parallel or interconnected streets (a street system). Normally the application will determine the extent of the area impacted. However, staff will review the application to determine if a smaller or larger impacted area is appropriate. A traffic calming measure installed to solve a problem in one location may move the problem to another location. This is not a desirable or acceptable result, except when traffic is moved from residential streets to arterials, which are expected to have more traffic.

An application for traffic calming will usually request that a particular area be considered. City staff will evaluate the impact of implementing traffic calming at the requested location or area on adjacent intersections, street sections or street systems. If installation of the measure will merely move the problem, either a more comprehensive traffic calming system will be considered, or no traffic calming will be allowed. If a more comprehensive system is required to solve the problem, the larger system must meet all the requirements of this program.

In some cases the impacted area may include another jurisdiction, such as San Carlos, San Mateo, Redwood City, San Mateo County or the State of California. In those cases, every effort will be made to involve the other jurisdiction, both staff and residents, to evaluate impacts.